The Fundamental Constants if c is Changing: A New Mass Constant and its Connection with the Electron FELIX T. SMITH, SRI International — When special relativity is extended to expanding hyperbolic position space [1], c decreases as $t^{-1/2}$ and there is a new expansion constant, $\sigma = c_0^2 H_0^{-1} = 3.89 \times 10^{34}$ m^{2}s^{-1}. Many fundamental constants become time-dependent and must be corrected by a small power of c. The corrected electrical permittivity of space is $\bar{\varepsilon}_o = \varepsilon_o c$, and α remains constant. The corrected gravitation constant is $\bar{G} = G/c$. A new fundamental mass constant of gravitation and cosmology occurs, $m_* = \left(\hbar^2/\bar{G}\sigma\right)^{1/3} = \left(\hbar^2 H_0/G_0 c_0\right)^{1/3}$, with the value $1.087\,(\pm 0.010) \times 10^{-28}$ kg. Its product αm_* with α accounts for 87% of the observed inertial mass m_e of the electron. This establishes a new phenomenological relationship between the constants of electromagnetism and the electron on the one hand and those of gravitation and cosmology on the other.
[1] F. T. Smith, Ann. Fond. L. de Broglie, **30**, 179 (2005););
http://www.ensmp.fr/aflb/AFLB-302/table302.htm

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